CLAIMS

1. A method of reforming an interlayer film for heat-insulating laminated glass,

wherein a high energy ray comprising an electromagnetic wave having energy of 3.0 eV or more is irradiated to an interlayer film for heat-insulating laminated glass comprising a heat-insulating fine particle covered with an inert substance, a matrix resin, and a liquid plasticizer, to improve transmittance of visible light having a wavelength of 380 to 780 nm, and also to reduce transmittance of a near-infrared radiation having a wavelength of 780 to 2100 nm.

2. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1,

wherein the high energy ray is at least one kind selected from the group consisting of a super UV light, a UV ray, a visible light, a super Xe light, a Xe light, a laser beam, an electron beam, and a microwave.

3. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1 or 2,

wherein the high energy ray comprises light having a wavelength of 300 to 450 nm.

4. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, or 3,

wherein the high energy ray is irradiated so that a yellow index value change (ΔYI) of an interlayer film for heat-insulating laminated glass represented by the following formula (1) is in the range of 0% or less, and a b* value change (Δb*) in CIE1976 L*a*b* display system represented by the following formula (2) is in the range of

0% or less, before and after irradiation of the high energy ray.

$\Delta YI = YI$ (after irradiation of high energy ray) $-YI$ (before irradiation of high energy ray) (1)

$\Delta b^* = b^*$ (after irradiation of high energy ray) $-b^*$ (before irradiation of high energy ray) (2)

5. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein the inert substance is an insulating metal oxide having band gap energy of 5.0 eV or more.

6. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein the inert substance is at least one kind selected from the group consisting of ammonium phosphomolybdate (hydrate), ammonium phosphovanadate (hydrate), ammonium phosphotungstate (hydrate), and ammonium phosphate (hydrate).

7. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein the inert substance is at least one kind selected from the group consisting of a hydroxy apatite, a carbonate apatite, a fluoride apatite, a tricalcium phosphate, and an octacalcium phosphate.

8. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein the inert substance is at least one kind selected from the group consisting of an organosilane

compound, an organotitanium compound, an organoaluminium compound, and an organozirconium-aluminium compound.

9. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 8,

wherein the organosilane compound, the organotitanium compound, the organoaluminium compound, and the organozirconium-aluminium compound, are aromatic compounds.

10. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein the inert substance is at least one kind selected from the group consisting of a compound having an alcoholic hydroxyl group, a compound having a phenolic hydroxyl group, and a compound having an isocyanate group.

11. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein the inert substance is at least one kind selected from the group consisting of a carbon tetrachloride, a quaternary-ammonium-salt compound, a $Mo(\eta^3\text{-}C_3H_5)_4$ complex, a $Cr(\eta^3\text{-}C_3H_5)_3$ complex, a $Co_2(CO)_8$ cluster, and a $Ru_3(CO)_{12}$ cluster.

12. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, or 4,

wherein a surface of the heat-insulating fine particle is inactivated by protecting the surface of the heat-insulating fine particle with an amorphous (noncrystalline) metal oxide.

13. The method of reforming an interlayer film for

heat-insulating laminated glass according to claim 12,

wherein the amorphous metal oxide is at least one kind selected from the group consisting of an amorphous indium oxide, an amorphous tin oxide, an amorphous antimony oxide, an amorphous indium tin oxide, an amorphous antimony oxide-doped tin oxide, an amorphous silicon oxide, an amorphous aluminum oxide, an amorphous zirconium oxide, an amorphous calcium oxide, an amorphous titanium oxide, an amorphous zinc oxide, and an amorphous cerium oxide.

14. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 or 13,

wherein the interlayer film for heat-insulating laminated glass comprises 3.0 parts by weight or less of an indium tin oxide (ITO) fine particle having an average particle diameter of 100 nm or less, and being protected in the surface, to 100 parts by weight of the matrix resin.

15. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 or 13,

wherein the heat-insulating fine particle is at least one kind selected from the group consisting of an indium tin oxide (ITO) fine particle, an antimony-doped tin oxide (ATO) fine particle, an aluminum-doped zinc oxide fine particle, an indium-doped zinc oxide fine particle, a gallium-doped zinc oxide fine particle, a lanthanum hexaboride fine particle, and a cerium hexaboride fine particle.

16. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15,

wherein the matrix resin is a polyvinyl acetal resin.

17. The method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16,

wherein the liquid plasticizer is at least one kind selected from the group consisting of a dihexyl adipate, a triethylene glycol di-2-ethylhexanoate, a tetraethylene glycol di-2-ethylhexanoate, a tetraethylene glycol di-2-ethylbutyrate, a tetraethylene glycol di-2-heptanoate, and a triethylene glycol di-heptanoate.

18. An interlayer film for heat-insulating laminated glass reformed by the method of reforming an interlayer film for heat-insulating laminated glass according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16,

which comprises a heat-insulating fine particle covered with an inert substance, a matrix resin, and a liquid plasticizer, transmittance of visible light having a wavelength of 380 to 780 nm being 70% or more, transmittance of a solar radiation having the wavelength of 300 to 2100 nm being 85% or less, and a haze value being 1.0% or less.

19. A laminated glass,

which is obtained by using the interlayer film for heat-insulating laminated glass according to claim 18.

20. A reformed heat-insulating fine particle,

which is obtained by irradiating a high energy ray comprising an electromagnetic wave having energy of 3.0 eV or more, to a heat-insulating fine particle covered with an inert substance.